REMARKS

Claim Rejections - 35 USC §102

Claims 1, 3-10, 12-21, 23, and 25-35 are rejected under 35 USC §102(e) as being anticipated by David E. Johnson et al (USPN 6,519,580, hereinafter "Johnson").

Johnson appears to disclose a method of decision-tree-based symbolic rule induction for text categorization to automatically categorize messages or documents containing text, which involves the combination of (1) inducing from the training data a decision tree for each category, (2) automated construction from each decision tree of a simplified symbolic rule set that is logically equivalent overall to the decision tree and use of the simplified symbolic rule set for categorization instead of the decision tree, and (3) determination of a confidence level for each rule. [Johnson Abstract]

Regarding claim 1, Applicants respectfully traverse the rejections since the Applicants' claimed combination, as exemplified in claim 1, includes the limitations not disclosed in Johnson of:

> "providing a plurality of categories organized in a hierarchy of categories;
> providing a plurality of categorizers corresponding to the plurality of categories;
> featurizing the item to create a list of item features;
> using the list of item features in a categorizer system including the plurality of categorizers for determining a plurality of levels of goodness;
> using one of the plurality of levels of goodness for invoking an additional categorizer of the plurality of categorizers as required;
> categorizing the item in the categorizer system in the plurality of categories based on the respective plurality of levels of goodness and
> returning the item categorized" [underlining for clarity]

Taken as a whole, Johnson appears to disclose using training data to form a decision tree from which a simplified symbolic rule set and a confidence level for the rule are determined that are used to categorize new data. Thus, Johnson teaches away from categorizing based on levels of goodness of lists of item features. Further, Johnson does not disclose: providing a plurality of categories...in a hierarchy of categories; providing a plurality of categories corresponding to the plurality of categories; featurizing an item to create a list of item features; using the list of item features...for determining a plurality of levels of goodness; using one of the plurality of levels of goodness for invoking an additional

categorizer...as required; or categorizing the item in the categorizer system in the plurality of categories based on the respective plurality of levels of goodness...

Based on the above, it is respectfully submitted that claim 1 is allowable under 35 USC §102(e) as not being anticipated by Johnson since:

"Anticipation requires the disclosure in a single prior art reference disclosure of each and every element of the claim under consideration." W.L. Gore & Assocs. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing Soundscriber Corp. v. United States, 360 F.2d 954, 960, 148 USPQ 298, 301 (Ct. Cl.), adopted, 149 USPQ 640 (Ct. Cl. 1966)), cert. denied, 469 U.S. 851 (1984). Carella v. Starlight Archery, 804 F.2d 135, 138, 231 USPQ 644, 646 (Fed. Cir.), modified on reh'g, 1 USPQ 2d 1209 (Fed. Cir. 1986); RCA Corp. v. Applied Digital Data Sys., Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984).

The Examiner states in the Office Action page 2 that Johnson discloses:

"providing a plurality of categories organized in a hierarchy of categories (see column 4, lines 62 - 65)"

However, Johnson column 4, lines 62 - 65, states:

"The unique technique of this method that, for the purpose of text categorization, integrates decision trees, simplified logically equivalent symbolic rule sets, and confidence levels is a mark of novelty." [underlining for clarity]

As whould be evident to those having ordinary skill in the art, this statement discloses determining a decision tree for deciding what text goes into what category and not for providing categories in a hierarchy of categories.

The Examiner states in the Office Action page 2 that Johnson discloses:

"providing a plurality of categorizers corresponding to the plurality of categories (see column 2, lines 39 - 40)"

However, Johnson column 2, lines 39 - 40, states:

"Precision and recall (1 and 2) are basic measures of the performance of a categorizer." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses parameters for measuring performance of a categorizer and not to providing a plurality of categorizers, which correspond to the categories.

The Examiner states in the Office Action page 3 that Johnson discloses:

"featurizing the item to create a list of item features (see column 4, lines 41 - 45)"

However, Johnson column 4, lines 41 - 45, states:

"Moreover, the rules produced by this method may involve more complicated features than simply single occurrences of words anywhere in a document. In particular, if the sections of a document in which a feature may occur are deemed significant, then an example of a rule might be..."[underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses the creation of the simplified symbolic rule set for categorization and not to featuring an item, such as determining the characteristics of text.

The Examiner states in the Office Action page 3 that Johnson discloses:

"using the list of item features in a categorizer system including the plurality of categorizers for determining a plurality of levels of goodness (see column 6, lines 1 - 16)"

However, Johnson column 6, lines 1 - 16, states:

"A means well suited to text data to induce decision trees, is shown in FIG. 4, and a means by which the categorizer is to be used to categorize documents, is shown in FIG. 8.

Principal Steps in the Rule Induction Procedure

The steps to be taken by a computer in creating a rule set for a category scheme from labeled training data are shown in FIG. 1. Referring to FIG. 1, first, the training processes is initialized in process block 11. This is meant to include supplying whatever values for any parameters that are needed by any of the following steps. For instance, such a parameter might be a maximum number of features to be put into a list of selected features as part of feature selection (FIG. 3, block 33), which is part of the process performed in block 15. Another parameter that might be supplied in would be information on the format of the data such as..."[underlining for clarity]

As would be evident to those having ordinary skill in the art, the first statement discloses inducing decision trees and the second statement discloses how to create a rule set and gives exemplary parameters for the rule set. Neither statement discloses using a list of item features in a categorizer system, which includes a plurality of categorizers, to determine levels of goodness.

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The Examiner states in the Office Action page 3 that Johnson discloses:

"using one of the plurality of levels of goodness for invoking an additional categorizer of the plurality of categorizers as required (see column 14, lines 24 - 65)"

However, Johnson column 14, lines 24 - 65, discloses:

"Rationale

The <u>value</u> of <u>converting decision trees into simplified logically equivalent symbolic rule sets</u>, instead of employing a text categorization system based solely on decision trees, is threefold:

1. A system based solely on <u>generating decision trees</u> from training data is useless for categories for which there is no training data. ...

2. A human user can understand and modify <u>a rule set</u> much more easily than the user can understand and modify a decision tree. ...

3. The fact that <u>a rule set is logically equivalent to a corresponding decision tree</u> for a particular text categorization problem guarantees that any mathematical analysis relating to the performance of the decision tree with respect to text categorization carries over to the rule set. ..." [underlining and deletions for clarity]

As would be evident to those having ordinary skill in the art, this section discloses the reason Johnson believes the Johnson's converting decision trees into simplified logically equivalent symbolic rule sets is valuable. It does not disclose using one of the plurality of levels of goodness for invoking an additional categorizer of the plurality of categorizers as required.

The Examiner states in the Office Action page 3 that Johnson:

"categorizing the item in the categorizer system in the plurality of categories based on the respective plurality of levels of goodness (see column 17, lines 59 - 67)"

However, Johnson column 17, lines 59 - 67, states:

"Categorizing Documents Using a Decision-Tree Based Symbolic Rule Set

FIG. 8 shows the steps to be taken by a computer <u>to use a set of rules for membership in a category, the rules being,</u> in the format of those <u>produced by a decision-tree-based symbolic rule induction system</u> (i.e., possibly with confidence levels) for the purpose of predicting whether or not a document is a member of that category, delivering a confidence" [underlining for clarity]

As would be evident to those having ordinary skill in the art, this section discloses developing a decision-tree-based symbolic rule induction system and confidence levels for each of the rules. It does not disclose categorizing based on a respective plurality levels of goodness.

The Examiner states in the Office Action page 3 that Johnson:

"returning the item categorized (see column 18, lines 15 - 21)"

However, Johnson column 18, lines 15 - 21, states:

"A representation r of document d is created in function block 83 in a manner corresponding to that used in the processing of the training data that induced RuleSet. The representation r is categorized using RuleSet in function block 84 by returning all categories and confidence levels from rule whose antecedent is true, when applied to r." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses returning categories and confidence levels, and does not disclose returning the item categorized.

Based on the above, it is respectfully submitted that claim 1 is allowable under 35 USC §102(e) as not being anticipated by Johnson since:

"[a]nticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, *arranged as in the claim*." [*emphasis added*] Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co. (730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)(citing Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 220 USPQ 193 (Fed Dir. 1983)))

Regarding claim 3, the Examiner states in the Office Action page 3 that Johnson:

"teaches using a categorizer system knowledge base for determining the level of goodness for a category with the list of item features(see column 6, lines 51 - 65)"

However, Johnson column 6, lines 51 - 65, states:

"A decision-tree-based set R(C) of symbolic rules for each category C is generated in function block 14. ... One way to generate a decision-tree-based set of symbolic rules for a category C is presented in a separate flow chart shown in FIG. 3, the details of which will be discussed in a later section.

The rule sets for all the categories are combined into a single rule set, referred to herein as RuleSet in function block 15.

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A <u>confidence level for each rule in RuleSet</u> is computed in function block 16. There are various ways to do this. One way to compute a confidence level is to user the precision of..." [underlining and deletions for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses confidence levels <u>for each rule in the Rule Set</u> and does not disclose determining a level of goodness <u>for a category</u>.

Regarding claim 4, the Examiner states in the Office Action page 3 that Johnson:

"teaches listing the plurality of categories and the respective levels of goodness on a list; and categorizing from the list (see column 6, lines 63 - 67)"

However, Johnson column 6, lines 63 - 67, states:

"A <u>confidence level for each rule in RuleSet</u> is computed in function block 16. There are various ways to do this. One way to compute a confidence level is to user the precision of each individual rule as measured on a set of data which has been labeled with categories as the confidence level." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses a confidence level for each rule in the rule set induced and does not disclose listing the plurality of categories and the respective level of goodness on the list.

Regarding claim 5, the Examiner states in the Office Action page 4 that Johnson:

"teaches returning one category for the item among the plurality of categories selected from a group consisting of the one category with the best level of goodness for all the plurality of categories and with the best level of goodness for which determining is completed where all of the plurality of categories are not compared (see column 18, lines 15 - 21)"

However, Johnson column 18, lines 15 - 21, states:

"A representation r of document d is created in function block 83 in a manner corresponding to that used in the processing of the training data that induced RuleSet. The representation r is categorized using RuleSet in function block 84 by <u>returning all categories and confidence levels</u> from rule whose antecedent is true, when applied to r." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses returning categories and confidence levels from a rule and does not disclose returning one category for the item among the plurality of categories selected from a group consisting of the

one category with the best level of goodness for all the plurality of categories and with the best level of goodness for which determining is completed where all of the plurality of categories are not compared.

Regarding claim 6, the Examiner states in the Office Action page 4 that Johnson:

"teaches returning a plurality of categories for the item among the plurality of categories returns a plurality of categories selected from a group consisting of categories up to a fixed number of the plurality of categories, categories having more than a fixed level of goodness, categories fulfilling a user specified preference, categories not from a categorizer, and categories which are a combination thereof (see column 18, lines 15 - 21)"

However, Johnson column 18, lines 15 - 21, states:

"A representation r of document d is created in function block 83 in a manner corresponding to that used in the processing of the training data that induced RuleSet. The representation r is categorized using RuleSet in function block 84 by returning all categories and confidence levels from rule whose antecedent is true, when applied to r." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses returning all categories and confidence levels from a rule and does not disclose returning a plurality of categories for the item among the plurality of categories returns a plurality of categories selected from a group consisting of categories up to a fixed number of the plurality of categories, categories having more than a fixed level of goodness, categories fulfilling a user specified preference, categories not from a categorizer, and categories which are a combination thereof.

Regarding claim 7, the Examiner states in the Office Action page 4 that Johnson:

"teaches returning the category for a plurality of items establishes a categorizer system knowledge base for a topic hierarchy (see column 18, lines 15 - 21)"

However, Johnson column 18, lines 15 - 21, states:

"A representation r of document d is created in function block 83 in a manner corresponding to that used in the processing of the training data that induced RuleSet. The representation r is categorized using RuleSet in function block 84 by returning all categories and confidence levels from rule whose antecedent is true, when applied to r." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses returning all categories and confidence levels from a rule and does not disclose returning the category for a plurality of items establishes a categorizer system knowledge base for a topic hierarchy.

Regarding claim 8, the Examiner states in the Office Action page 5 that Johnson:

"teaches listing a plurality of labels for each of the plurality of categories (see column 1, lines 24 - 27)"

However, Johnson column 1, lines 24 - 27, states:

"The text categorization problem is to determine predefined categories for an incoming unlabeled message or document containing text based on information extracted from a training set of labeled messages or documents." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses the text categorization problem with no solution disclosed and does not disclose listing a plurality of labels for each of the plurality of categories.

The Examiner states in the Office Action page 5 that Johnson discloses:

"training a categorizer system trainer using a plurality of items having known categories and the plurality of labels to provide a categorizer system knowledge base (see column 6, lines 39 - 42)"

However, Johnson column 6, lines 39 - 42, states:

"Once the training process has been initialized, the training data is input in function block 12. The training data is assumed to be labeled by categories according to some categorization scheme." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses only that there is an assumption that the training data is labeled and does not disclose training a categorizer system trainer.

Regarding claim 9, the Examiner states in the Office Action page 5 that Johnson:

"teaches providing a categorizer system knowledge base (see column 2, lines 39 - 40)"

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However, Johnson column 2, lines 39 - 40, states:

"Precision and recall (1 and 2) are basic measures of the performance of a categorizer." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses basic measures of performance and does not disclose providing a categorizer system knowledge base.

The Examiner states in the Office Action page 5 that Johnson:

"using a plurality of items with known categories to learn knowledge in the categorizer system knowledge base (see column 1, lines 24 - 27)"

However, Johnson column 1, lines 24 - 27, states:

"The text categorization problem is to determine predefined categories for an incoming unlabeled message or document containing text based on information extracted from a training set of labeled messages or documents." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses a problem with no solution and does not disclose using a plurality of items with known categories to learn knowledge in the categorizer system knowledge base.

Regarding claim 10, the Examiner states in the Office Action page 5 that Johnson:

"teaches providing a categorizer system knowledge base (see column 2, lines 39 - 40)"

However, Johnson column 2, lines 39 - 40, states:

"Precision and recall (1 and 2) are basic measures of the performance of a categorizer." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses measures for performance and does not disclose providing a categorizer system knowledge base.

The Examiner states in the Office Action page 5 that Johnson:

"providing a plurality of categorizers, each using knowledge in a categorizer system knowledge base and the list of item features to compute a degree of goodness for a plurality of categories, independent of other categorizers, each using a subset of item features to compute a degree of goodness for a plurality of categories, independent of other categorizers, and

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each subset independent of subsets used by other categorizers (see column 2, lines 39 - 64)"

However, Johnson column 2, lines 39 - 64, states:

"Precision and recall (1 and 2) are <u>basic measures of the performance</u> of a categorizer. Precision is .... Recall is ... Precision and recall are ...

<u>Multiple categorization (3) is the possibility for a single document to be assigned to more than one category</u>. This is an essential kind of flexibility needed in many applications. However, a text categorization system that provides for multiple categorization is well-served by a method for assessing the significance of more than one category being assigned to a document. Such a method is the provision of confidence levels (4)." [underlining and deletions for clarity]

As would be evident to those having ordinary skill in the art, this section discloses basic measures of the performance and indicates that it is possible for a single document to be assigned to more than one category. This section does not disclose providing a plurality of categorizers, each using knowledge in a categorizer system knowledge base and the list of item features to compute a degree of goodness for a plurality of categories, independent of other categorizers, each using a subset of item features to compute a degree of goodness for a plurality of categories, independent of other categorizers, and each subset independent of subsets used by other categorizers.

The Examiner states in the Office Action page 5 that Johnson:

"providing a mechanism to resolve the levels of goodness for a plurality of categories resulting from multiple categorizers into a combined level of goodness for a plurality of categories (see column 2, lines 1 - 10 and lines 65 - 67)"

However, Johnson column 2, lines 1 - 10 and lines 65 - 67, states:

". . . [occurs at] most one time in the document and the word `acquire` occurs more than twice in the document, then classify the document in the category `acq`." Here the antecedent is

share>3 & year<=1 & acquire>2

and the consequent is acq. Alternatively, the rule above could be read as "if words equivalent to `share` occur more than three times in the document and words equivalent to `year` occur at most one time in the document and words equivalent to `acquire` occur more than twice in the"

"<u>Confidence levels</u> are quantified relative indicators of the level of confidence that <u>may be placed in a categorizer's recommendations</u>." [underlining for clarity]

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As would be evident to those having ordinary skill in the art, this statement discloses that confidence levels may be placed in a categorizer's recommendations and does not disclose a mechanism to resolve the levels of goodness from multiple categorizers into a combined level of goodness for a plurality of categories.

Regarding claim 12, this independent claim is believed to be allowable for the same reasons as given for claim 1 and because it includes the limitations not disclosed in Johnson of :

> "providing a plurality of categories organized in a hierarchy of categories;
> providing a plurality of categorizers corresponding to the plurality of categories;
> featurizing the document to create a list of document features;
> using the list of document features in a categorizer system including the plurality of categorizers for determining a plurality of levels of goodness;
> using one of the plurality of levels of goodness for invoking an additional categorizer of the plurality of categorizers as required;
> categorizing the document in categorizer system in the plurality of categories based on the respective plurality of levels of goodness; and
> returning a category for the document."

Regarding claim 13, the Examiner states in the Office Action page 6 that Johnson:

> "teaches determining the plurality of levels of goodness includes using a process selected from a group consisting of Naive Bayes, quantitative decision-tree classifiers such as C4.5, Bayesian networks, rule-based multi-class classifiers that output a degree of goodness, conditional probability statements, simple heuristics, and a combination thereof (see column 1, lines 40 - 43 and column 18, lines 42 - 45)"

However, Johnson column 1, lines 40 - 43 and column 18, lines 42 - 45, states:

> "Previous text categorization methods have used decision trees, naive Bayes classifiers, nearest neighbor methods, neural nets, support vector machines and various kinds of symbolic rule induction."

> "DTREE compares very favorably with results using the C4.5 decision tree induction algorithm. For additional comparison, a linear least squares fitting (LLSF) algorithm was also implemented." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this section teaches away from the claimed limitations in comparing the invention favorably with previous text

categorization methods that are not used, and does not disclose determining levels of goodness.

Regarding claim 14, this dependent claim depends from independent claim 12 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof. The claim is also believed to be allowable for the same reasons given for claim 3.

Regarding claim 15, this dependent claim depends from independent claim 12 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof. The claim is also believed to be allowable for the same reasons given for claim 4.

Regarding claim 16, this dependent claim depends from independent claim 12 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof. The claim is also believed to be allowable for the same reasons given for claim 5.

Regarding claim 17, the Examiner states in the Office Action page 7 that Johnson:

"teaches returning a plurality of categories for the document among the plurality of categories returns a plurality of categories selected from a group consisting of categories up to a fixed number of the plurality of categories, categories having more than a fixed level of goodness, categories fulfilling a user specified preference, categories not from a categorizer, and categories which are a combination thereof (see 17, lines 61 - 67 and column 18, lines 15 - 21)"

However, Johnson column 17, lines 61 - 67 and column 18, lines 15 - 21, states:

"FIG. 8 shows the steps to be taken by a computer to use a set of rules for membership in a category, the rules being, in the format of those produced by a decision-tree-based symbolic rule induction system (i.e., possibly with confidence levels) for the purpose of predicting whether or not a document is a member of that category, delivering a confidence"

"A representation r of document d is created in function block 83 in a manner corresponding to that used in the processing of the training data that induced RuleSet. The representation r is categorized using RuleSet in function

block 84 by <u>returning all categories and confidence levels from rule</u> whose antecedent is true, when applied to r." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses returning all categories and confidence levels from a rule, and does not disclose returning a plurality of categories returns a plurality of categories selected from a group consisting of categories having different characteristics.

Regarding claim 18, this dependent claim depends from independent claim 12 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof. The claim is also believed to be allowable for the same reasons given for claim 7.

Regarding claim 19, this dependent claim depends from independent claim 12 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof. The claim is also believed to be allowable for the same reasons given for claim 8.

Regarding claim 20, this dependent claim depends from independent claim 12 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof. The claim is also believed to be allowable for the same reasons given for claim 9.

Regarding claim 21, this dependent claim depends from independent claim 12 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof. The claim is also believed to be allowable for the same reasons given for claim 10.

Regarding claim 23, this dependent claim depends from independent claim 12 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof. The claim is also believed to be allowable for the same reasons given for claim 1.

Regarding claim 25, this dependent claim depends from independent claim 12 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof. The claim is also believed to be allowable for the same reasons given for claim 3.

Regarding claim 26, the Examiner states in the Office Action page 8 that Johnson:

"teaches a categorizer system trainer trained using a plurality of items having known categories and the plurality of labels to provide a categorizer system knowledge base (see column 3, lines 24 - 28 and column 6, lines 39 - 42)"

However, Johnson column 3, lines 24 - 28 and column 6, lines 39 - 42, states:

"According to the invention, a method of solution fits in the general framework of supervised learning, in which a rule or rules for categorizing data is automatically constructed by a computer on the basis of training data that has been labeled with a predefined set of categories beforehand."

"Once the training process has been initialized, the training data is input in function block 12. The training data is assumed to be labeled by categories according to some categorization scheme." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses only that there is an assumption that the training data is labeled and does not disclose training a categorizer system trainer.

Regarding claim 27, the Examiner states in the Office Action page 9 that Johnson discloses:

"a categorizer system knowledge base having a plurality of categories organized in a hierarchy of categories and having respective lists of category features (see column 4, lines 62 - 65 and column 6, lines 63 - 67)"

However, Johnson column 4, lines 62 - 65 and column 6, lines 63 - 67, states:

"The unique technique of this method that, for the purpose of text categorization, integrates decision trees, simplified logically equivalent symbolic rule sets, and confidence levels is a mark of novelty."

"A confidence level for each rule in RuleSet is computed in function block 16. There are various ways to do this. One way to compute a confidence level is to user the precision of each individual rule as measured on a set of

data which has been labeled with categories as the confidence level." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses a confidence level for each rule in the set of rules and does not disclose a categorizer system knowledge base having a plurality of categories organized in a hierarchy of categories and having respective lists of category features.

The Examiner states in the Office Action page 9 that Johnson discloses:

"a featurizer for featurizing the item to create a list of item features (see column 2, lines 39 - 40)"

However, Johnson column 2, lines 39 - 40, states:

"Precision and recall (1 and 2) are basic measures of the performance of a categorizer." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses parameters for measuring performance of a categorizer and not to providing a featurizer for featurizing the item to create a list of item features.

The Examiner states in the Office Action page 9 that Johnson discloses:

"a categorizer system connected to the categorization system knowledge base including:

a plurality of categorizers having one of the plurality of categories, the plurality of categorizers for using the list of item features with the lists of category features to respectively determine a plurality of levels of goodness, the plurality of categorizers categorizing the item in the categorizer system in the plurality of categories based on the respective plurality of levels of goodness (see column 16, lines 1 - 16 and column 17, lines 59 - 67)"

However, Johnson column 16, lines 1 - 16 and column 17, lines 59 - 67, states:

"instead of the more complex, but logically equivalent rule of
$(B>3)\wedge(B<5)\rightarrow X$.
Also under the assumption that the values of B are nonnegative integers,
$(B=0)\rightarrow X$
is logically equivalent to,
$(B<1)\rightarrow X$.
It is straightforward to write a computer program to construct logically equivalent simplifications of rules of these kinds.
The third simplification possible is the alteration of the rule set by the deletion of conditions that are superfluous in"

"Categorizing Documents Using a Decision-Tree Based Symbolic Rule Set

FIG. 8 shows <u>the steps to be taken by a computer to use a set of rules</u> for membership in a category, the rules being, in the format of those produced by a decision-tree-based symbolic rule induction system (i.e., possibly with confidence levels) for the purpose of predicting whether or not a document is a member of that category, delivering a confidence" [underlining for clarity]

As would be evident to those having ordinary skill in the art, the first section discloses simplifications of the Johnson rule based system and the second section discloses how a computer uses the rules. Neither section discloses a categorizer system connected to the categorization system knowledge base including the enumerated element.

The Examiner states in the Office Action page 9 that Johnson:

"a mechanism for using one of the plurality of levels of goodness for invoking an additional categorizer of the plurality of categorizers as required (see column 6, lines 63 - 67)"

However, Johnson column 6, lines 63 - 67, states:

"A <u>confidence level for each rule in RuleSet</u> is computed in function block 16. There are various ways to do this. One way to compute a confidence level is to user the precision of each individual rule as measured on a set of data which has been labeled with categories as the confidence level." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses a confidence level for each rule in the set of rules and does not disclose a mechanism for using one of the plurality of levels of goodness for invoking an additional categorizer of the plurality of categorizers as required.

The Examiner states in the Office Action page 9 that Johnson discloses:

"a return for returning the item categorized (see column 18, lines 15 - 21)"

However, Johnson column 18, lines 15 - 21, states:

"A representation r of document d is created in function block 83 in a manner corresponding to that used in the processing of the training data that induced RuleSet. The representation r is categorized using RuleSet in function block 84 by <u>returning all categories and confidence levels from rule</u> whose antecedent is true, when applied to r." [underlining for clarity]

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As would be evident to those having ordinary skill in the art, this statement discloses returning all categories and confidence levels from a rule and does not disclose a return for returning the item categorized.

Regarding claim 28, this claim was rejected but no basis for the rejection was given. However, this dependent claim depends from independent claim 12 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof.

Regarding claim 29, the Examiner states in the Office Action page 10 that Johnson:

"teaches the categorizer system knowledge base determines the lists of category features (see column 6, lines 51 - 65)"

However, Johnson column 6, lines 51 - 65, states:

"A decision-tree-based set R(C) of symbolic rules for each category C is generated in function block 14. Since the rule sets are to be generated on a per category basis, there is no insistence that a document belong to at most one category, so that multiple categorization is intrinsically supported by this method. One way to generate a decision-tree-based set of symbolic rules for a category C is presented in a separate flow chart shown in FIG. 3, the details of which will be discussed in a later section.

The rule sets for all the categories are combined into a single rule set, referred to herein as RuleSet in function block 15.

A confidence level for each rule in RuleSet is computed in function block 16. There are various ways to do this. One way to compute a confidence level is to user the precision of" [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses how the rules are generated and does not disclose that the categorizer system knowledge base determines the lists of category features.

Regarding claim 30, the Examiner states in the Office Action page 10 that Johnson:

"teaches the plurality of categorizers include a list mechanism for listing the plurality of categories and the respective levels of goodness (see column 6, lines 63 - 67)"

However, Johnson column 6, lines 63 - 67, states:

"A <u>confidence level for each rule in RuleSet</u> is computed in function block 16. There are various ways to do this. One way to compute a confidence level is to user the precision of each individual rule as measured on a set of data which has been labeled with categories as the confidence level." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses confidence levels for each rule in the Rule Set and does not disclose a plurality of categorizers that include a list mechanism for listing the plurality of categories and the respective levels of goodness.

The Examiner states in the Office Action page 10 that Johnson:

"the plurality of categorizers categorizes from the list mechanism (see column 6, lines 51 - 65)"

However, Johnson column 6, lines 51 - 65, states:

"A <u>decision-tree-based set R(C) of symbolic rules for each category C is generated</u> in function block 14. Since the rule sets are to be generated on a per category basis, there is no insistence that a document belong to at most one category, so that multiple categorization is intrinsically supported by this method. One way to generate a decision-tree-based set of symbolic rules for a category C is presented in a separate flow chart shown in FIG. 3, the details of which will be discussed in a later section.

The <u>rule sets</u> for all the categories are combined into a single rule set, referred to herein as RuleSet in function block 15.

A confidence level for each rule in RuleSet is computed in function block 16. There are various ways to do this. One way to compute a confidence level is to user the precision of" [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses how the rules are generated and does not disclose that a plurality of categorizers categorizes from the list mechanism.

Regarding claim 31, the Examiner states in the Office Action page 10 that Johnson:

"teaches the return returns one category for the item among the plurality of categories selected from a group consisting of the one category with the best level of goodness for all the plurality of categories and with the best level of goodness for which determining is completed where all of the plurality of categories are not compared (see column 18, lines 15 - 21)"

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However, Johnson column 18, lines 15 - 21, states:

> "A representation r of document d is created in function block 83 in a manner corresponding to that used in the processing of the training data that induced RuleSet. The representation r is categorized using RuleSet in function block 84 by <u>returning all categories and confidence levels from rule</u> whose antecedent is true, when applied to r." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses returning all categories and confidence levels from rule and does not disclose a return returns one category for the item among the plurality of categories selected from a group consisting of the one category with the best level of goodness for all the plurality of categories and with the best level of goodness for which determining is completed where all of the plurality of categories are not compared.

Regarding claim 32, the Examiner states in the Office Action page 10 that Johnson:

> "teaches the return returns a plurality of categories for the item among the plurality of categories returns a plurality of categories selected from a group consisting of categories up to a fixed number of the plurality of categories, categories having more than a fixed level of goodness, categories fulfilling a user specified preference, categories not from a categorizer, and categories which are a combination thereof (see column 18, lines 15 - 21)"

However, Johnson column 18, lines 15-21, states:

> "A representation r of document d is created in function block 83 in a manner corresponding to that used in the processing of the training data that induced RuleSet. The representation r is categorized using RuleSet in function block 84 by <u>returning all categories and confidence levels from rule</u> whose antecedent is true, when applied to r." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses returning all categories and confidence levels from rule and does not disclose a return returns a plurality of categories for the item among the plurality of categories returns a plurality of categories selected from a group consisting of categories up to a fixed number of the plurality of categories, categories having more than a fixed level of goodness, categories fulfilling a user specified preference, categories not from a categorizer, and categories which are a combination thereof.

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Regarding claim 33, the Examiner states in the Office Action page 11 that Johnson:

"teaches the return returns the category for a plurality of items to the categorizer system knowledge base for building a topic hierarchy (see column 18, lines 15 - 21)"

However, Johnson column 18, lines 15 - 21, states:

"A representation r of document d is created in function block 83 in a manner corresponding to that used in the processing of the training data that induced RuleSet. The representation r is categorized using RuleSet in function block 84 by returning all categories and confidence levels from rule whose antecedent is true, when applied to r." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses returning all categories and confidence levels from rule and does not disclose that a return returns the category for a plurality of items to the categorizer system knowledge base for building a topic hierarchy.

Regarding claim 34, the Examiner states in the Office Action page 11 that Johnson:

"teaches a further listing mechanism for listing a plurality of labels for each of the plurality of categories (see column 1, lines 24 - 27)"

However, Johnson column 1, lines 24 - 27, states:

"The text categorization problem is to determine predefined categories for an incoming unlabeled message or document containing text based on information extracted from a training set of labeled messages or documents." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses the text categorization problem with no solution disclosed and does not disclose a further listing mechanism for listing a plurality of labels for each of the plurality of categories.

The Examiner states in the Office Action page 11 that Johnson:

"a categorizer system trainer trained using a plurality of items having known categories and the plurality of labels to provide the categorizer system knowledge base (see column 6, lines 39 - 42)"

However, Johnson column 6, lines 39 - 42, states:

"Once the training process has been initialized, the training data is input in function block 12. The training data is assumed to be labeled by categories according to some categorization scheme." [underlining for clarity]

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As would be evident to those having ordinary skill in the art, this statement discloses only that there is an assumption that the training data is labeled and does not disclose training a categorizer system trainer.

Regarding claim 35, the Examiner states in the Office Action page 11 that Johnson discloses:

> "a categorizer system knowledge base having a plurality of categories having respective lists of category features (see column 4, lines 62 - 65 and column 6, lines 63 - 67)"

However, Johnson column 4, lines 62 - 65 and column 6, lines 63 - 67, states:

> "The unique technique of this method that, <u>for the purpose of text categorization, integrates decision trees,</u> simplified logically equivalent symbolic rule sets, and confidence levels is a mark of novelty."

> "A <u>confidence level for each rule in RuleSet</u> is computed in function block 16. There are various ways to do this. One way to compute a confidence level is to user the precision of each individual rule as measured on a set of data which has been labeled with categories as the confidence level." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses determining a decision tree for deciding what text goes into what category and a confidence level for a rule, and does not disclose a categorizer system knowledge base having a plurality of categories having respective lists of category features.

The Examiner states in the Office Action page 11 that Johnson discloses:

> "a featurizer for featurizing the item to create a list of item features (see column 2, lines 39 - 40)"

However, Johnson column 2, lines 39 - 40, states:

> "Precision and recall (1 and 2) are <u>basic measures</u> of the performance of a categorizer." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this section discloses basic measures of the performance and does not disclose a featurizer for featurizing the item to create a list of item features.

The Examiner states in the Office Action page 11 that Johnson:

> "a plurality of categorizers having the plurality of categories, the plurality of categorizers for determining the list of item features with the lists

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of category features to respectively determine a plurality of levels of goodness, the plurality of categorizers categorizing the item in the categorizer system in the plurality of categories based on the respective plurality of levels of goodness (see column 16, lines 1 -16 and column 17, lines 59 - 67)"

However, Johnson column 16, lines 1 - 16 and column 17, lines 59 - 67, states:

"instead of the more complex, but logically equivalent rule of
$(B>3)\wedge(B<5)\rightarrow X$.
Also under the assumption that the values of B are nonnegative integers,
$(B=0)\rightarrow X$
is logically equivalent to,
$(B<1)\rightarrow X$.
It is straightforward to write a computer program to construct logically equivalent simplifications of rules of these kinds.
The third simplification possible is the alteration of the rule set by the deletion of conditions that are superfluous in"

"Categorizing Documents Using a Decision-Tree Based Symbolic Rule Set

FIG. 8 shows the steps to be taken by a computer to use a set of rules for membership in a category, the rules being, in the format of those produced by a decision-tree-based symbolic rule induction system (i.e., possibly with confidence levels) for the purpose of predicting whether or not a document is a member of that category, delivering a confidence" [underlining for clarity]

As would be evident to those having ordinary skill in the art, the first section discloses simplifications of the Johnson rule based system and the second section discloses how a computer uses the rules. Neither section discloses a plurality of categorizers having the plurality of categories, the plurality of categorizers for determining the list of item features with the lists of category features to respectively determine a plurality of levels of goodness, the plurality of categorizers categorizing the item in the categorizer system in the plurality of categories based on the respective plurality of levels of goodness.

The Examiner states in the Office Action page 12 that Johnson discloses:

"a mechanism for using one of the plurality of levels of goodness for invoking an additional categorizer of the plurality of categorizers as required a listing mechanism for listing the plurality of categories and the respective levels of goodness on a list (see column 6, lines 63 - 67)"

However, Johnson column 6, lines 63 - 67, states:

"A confidence level for each rule in RuleSet is computed in function block 16. There are various ways to do this. One way to compute a confidence level is to user the precision of each individual rule as measured on a set of

data which has been labeled with categories as the confidence level."
[underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses confidence level for each rule in the RuleSet and does not disclose a mechanism for using one of the plurality of levels of goodness for invoking an additional categorizer of the plurality of categorizers as required a listing mechanism for listing the plurality of categories and the respective levels of goodness on a list.

The Examiner states in the Office Action page 12 that Johnson discloses:

"a return for returning a category for the item from the list (see column 18, lines 15 - 21)"

However, Johnson column 18, lines 15 - 21, states:

"A representation r of document d is created in function block 83 in a manner corresponding to that used in the processing of the training data that induced RuleSet. The representation r is categorized using RuleSet in function block 84 by returning all categories and confidence levels from rule whose antecedent is true, when applied to r." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses returning all categories and confidence levels from a rule and does not disclose a return for returning a category for the item from the list.

Based on the above, it is respectfully submitted that claims 1, 3-10, 12-21, 23, and 25-35 are allowable under 35 USC §102(e) as not being anticipated by Johnson.

Claim Rejections - 35 USC §103

Claims 2, 11, 22, 24, and 28 are rejected under 35 USC §103(a) as being unpatentable over David E. Johnson et al (USPN 6,519,580, hereinafter "Johnson") in view of Rakesh Agrawal et al. (USPN 6,233,575, hereinafter "Agrawal").

Johnson has been summarized above for the 35 USC §102 rejections.

Agrawal teaches that, given sample documents belonging to various nodes in the topic hierarchy, tokens (terms, phrases, dates, or other usable feature in the document) that are most useful at each internal decision node for the purpose of routing new documents to the children

of that node can be automatically detected. Using the tokens, <u>statistical models are constructed for each topic node</u> and <u>are used in an estimation technique</u> to assign topic paths to new unlabeled documents. [Agrawal Abstract]

Applicants first respectfully traverse with regard to claims 2, 11, 22, 24, and 28 together.

Taken as a whole, Johnson appears to teach using training data to form a decision tree from which a simplified symbolic rule set and a confidence level for the rule set are determined that are used to categorize new data. Taken as a whole, Agrawal appears to teach using statistical models and estimation techniques to assign topic paths and teaches away from using levels of goodness to invoke categorizers. It is respectfully submitted that two conflicting systems are taught to categorize the same document. Johnson appears to teach a simplified symbolic rule set and a confidence level for the rule set to be used for forming decision trees. Therefore, the Agrawal statistical models and estimation techniques cannot also be used to assign topic paths (decision trees). In *In re* Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984), the CAFC stated:

> "We have noted elsewhere, as a "useful general rule," that references that teach away cannot serve to create a prima facie case of obviousness... If references taken in combination would produce a "seemingly inoperative device, " we have held that such references teach away from the combination and thus cannot serve as predicates for a prima facia case of obviousness."

Based on the above, it is respectfully submitted that claims 2, 11, 22, 24, and 28 are allowable under 35 USC § 103(a) as being unobvious over Johnson in view of Agrawal.

In addition, it is respectfully submitted that *In re* Sang-Su Lee, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002), holds that the conclusion of obviousness may <u>not</u> be made from common knowledge and common sense of a person of ordinary skill in the art <u>without any specific hint or suggestion *in a particular reference*</u>. In particular, the Examiner states in the Office Action page 13:

> "It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine teaching of Johnson with the teaching of Agrawal wherein levels are the hierarchical structure of the items. <u>Resolving the levels is breaking the hierarchical levels of nodes and leaves.</u>

The motivation is that the hierarchical levels make searching of items or document easier." [underlining for clarity]

If the Examiner is correct that "breaking the hierarchical levels of nodes and leaves" provides the motivation, Agrawal would render Johnson, which relies on decision trees, inoperative and would not only teach away from the combination, but would also indicate that there is no hint or suggestion in either reference for the combination. Therefore, it is respectfully submitted that not only would the combination be unobvious in view of *In re Gordon*, supra. , but it would also lack the hint or suggestion being combined in view of *In re Sang-Su Lee*.

Based on the above, it is respectfully submitted that claims 2, 11, 22, 24, and 28 are allowable under 35 USC §103(a) as being unobvious over Johnson in view of Agrawal.

Regarding claim 2, the Examiner states in the Office Action page 13 that Agrawal:

"teaches using the list of item features determines the plurality of levels of goodness using a process to quantify the plurality of levels of goodness, to prioritize the plurality of levels of goodness, and to resolve two levels of goodness into a third level of goodness (see Fig. 2; column 9, lines 58 - 67; column 11, lines 64 - 67 and column 12, lines 1 -11)"

However, Agrawal Fig. 2; column 9, lines 58 - 67; column 11, lines 64 - 67 and column 12, lines 1 -11, do not show the claim limitation above:

"An example of <u>a tree-like topic hierarchy, or taxonomy, for organizing a database of topical documents is shown in FIG. 2</u>. The tree 20 includes a first level comprising a single node 22 titled "All Topics." A second level of the tree may divide the first level "All Topics" node into several further nodes directed to general topic categories, such as Business and Economy 24, Recreation 26, Science 28, and so forth. Each of the second level nodes may be divided, at the third level, into several further nodes directed to more specific topics within each second level topic."

"If the action type is "test", documents are tokenized in block 92. In block 94, the <u>root topic is selected</u> as a starting point. In block 96, a <u>top topic is picked form the pool</u> (i.e., a topic with a high goodness score). In block 98, using indexed statistics from block 90 (as indicated by the arrow from block 90 to block 98), <u>the children of the picked topic are evaluated and the best ones</u> (i.e., those with high goodness scores) <u>are added to the pool</u>. In block 100, it is determined whether there are enough leaf topics. <u>If there are not enough leaf topics</u>, at block 96, <u>another topic is picked</u>. Otherwise, the context-dependent signatures are computed in block 102. The computation of context-dependent signatures is discussed in more detail under the "Extracting

Document Signatures" heading below. These context-dependent signatures are displayed or indexed in block 104." [underlining for clarity]

As would be evident to those having ordinary skill in the art, Fig. 2 and the first statement disclose only a tree-like topic hierarchy and the second statement discloses how topics are picked to form a pool based on goodness score. Neither discloses using a list of item features determines the plurality of levels of goodness using a process to quantify the plurality of levels of goodness, to prioritize the plurality of levels of goodness, and to resolve two levels of goodness into a third level of goodness

Regarding claim 11, the Examiner states in the Office Action page 13 that Johnson:

"providing a plurality of categories organized in a hierarchy of categories and having respective lists of category features using a categorizer system knowledge base for determining the lists of category features (see column 6, lines 63 - 67)"

However, Johnson column 6, lines 63 - 67, states:

"A <u>confidence level for each rule in RuleSet</u> is computed in function block 16. There are various ways to do this. One way to compute a confidence level is to user the precision of each individual rule as measured on a set of data which has been labeled with categories as the confidence level." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses a confidence level for each rule in the set of rules and does not disclose providing a plurality of categories organized in a hierarchy of categories and having respective lists of category features using a categorizer system knowledge base for determining the lists of category features.

The Examiner states in the Office Action page 14 that Johnson:

"providing a plurality of categorizers corresponding to one of the plurality of categories (see column 6, lines 1 - 3 and lines 39 - 42)"

However, Johnson column 6, lines 1 - 3 and lines 39 - 42, states:

"A means well suited to text data to induce decision trees, is shown in FIG. 4, and a means by which the categorizer is to be used to categorize documents, is shown in FIG. 8."

"Once the training process has been initialized, the training data is input in function block 12. The training data is <u>assumed to be</u> labeled by categories according to some categorization scheme." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses only that there is an assumption that the training data is labeled and does not disclose a plurality of categorizers corresponding to one of the plurality of categories.

The Examiner states in the Office Action page 14 that Johnson:

"featurizing the item to create a list of item features (see column 2, lines 39 - 40)"

However, Johnson column 2, lines 39 - 40, states:

"Precision and recall (1 and 2) are basic measures of the performance of a categorizer."

As would be evident to those having ordinary skill in the art, this section discloses basic measures of the performance and does not disclose featurizing the item to create a list of item features.

The Examiner states in the Office Action page 14 that Johnson:

"using one of the plurality of levels of goodness for invoking an additional categorizer of the plurality of categorizers as required (see column 14, lines 24 - 65)"

However, Johnson column 14, lines 24 - 65, states:

"Rationale

The value of converting decision trees into simplified logically equivalent symbolic rule sets, instead of employing a text categorization system based solely on decision trees, is threefold:

1. A system based solely on generating decision trees from training data is useless for categories for which there is no training data. ...

2. A human user can understand and modify a rule set much more easily than the user can understand and modify a decision tree. ...

3. The fact that a rule set is logically equivalent to a corresponding decision tree for a particular text categorization problem guarantees that any mathematical analysis relating to the performance of the decision tree with respect to text categorization carries over to the rule set. ..." [underlining and deletions for clarity]

As would be evident to those having ordinary skill in the art, this section discloses the reason Johnson believes the Johnson's converting decision trees into simplified logically equivalent symbolic rule sets is valuable. It does not disclose using one of the plurality of

levels of goodness for invoking an additional categorizer of the plurality of categorizers as required.

The Examiner states in the Office Action page 14 that Johnson:

"categorizing the item in the categorizer system in the plurality of categories based on the respective plurality of levels of goodness (see column 17, lines 59 - 67)"

However, Johnson column 17, lines 59 - 67, states:

"Categorizing Documents Using a Decision-Tree Based Symbolic Rule Set

FIG. 8 shows the steps to be taken by a computer <u>to use a set of rules for membership in a category</u>, <u>the rules being</u>, in the format of those <u>produced by a decision-tree-based symbolic rule induction system</u> (i.e., possibly with confidence levels) for the purpose of predicting whether or not a document is a member of that category, delivering a confidence" [underlining for clarity]

As would be evident to those having ordinary skill in the art, this section discloses developing a decision-tree-based symbolic rule induction system and confidence levels for each of the rules. It does not disclose categorizing...based on the respective plurality levels of goodness.

The Examiner states in the Office Action page 14 that Johnson:

"listing the plurality of categories and the respective levels of goodness on a list (see column 1, lines 24 - 27 and column 6, lines 63 - 67)"

However, Johnson column 1, lines 24 - 27 and column 6, lines 63 - 67, respectively state:

"The <u>text categorization problem</u> is to determine predefined categories for an incoming unlabeled message or document containing text based on information extracted from a training set of labeled messages or documents."

"A <u>confidence level for each rule in RuleSet</u> is computed in function block 16. There are various ways to do this. One way to compute a confidence level is to user the precision of each individual rule as measured on a set of data which has been labeled with categories as the confidence level." [underlining for clarity]

As would be evident to those having ordinary skill in the art, the first statement discloses the text categorization problem without disclosure of a solution, and the second statement discloses that a confidence level is set for each rule. Neither statement discloses listing the plurality of categories and the respective levels of goodness on a list.

The Examiner states in the Office Action page 14 that Johnson:

"returning a category for the item from the list (see column 6, lines 51 - 65 and column 18, lines 15 - 21)"

However, Johnson column 6, lines 51 - 65 and column 18, lines 15 - 21, respectively state:

"A decision-tree-based set R(C) of symbolic rules for each category C is generated in function block 14. ... One way to generate a decision-tree-based set of symbolic rules for a category C is presented in a separate flow chart shown in FIG. 3, the details of which will be discussed in a later section.

The rule sets for all the categories are combined into a single rule set, referred to herein as RuleSet in function block 15.

A confidence level for each rule in RuleSet is computed in function block 16. There are various ways to do this. One way to compute a confidence level is to user the precision of..."

"A representation r of document d is created in function block 83 in a manner corresponding to that used in the processing of the training data that induced RuleSet. The representation r is categorized using RuleSet in function block 84 by returning all categories and confidence levels from rule whose antecedent is true, when applied to r." [deletions and underlining for clarity]

As would be evident to those having ordinary skill in the art, the first statement discloses confidence levels for each rule in the Rule Set and the second statement discloses returning categories and confidence levels from a rule. Neither discloses returning a category for the item from the list.

The Examiner states in the Office Action page 15 that Agrawal:

"teaches using the list of item features in a categorizer system including the plurality of categorizers with the lists of category features to respectively determine a plurality of levels of goodness, the plurality of levels of goodness determined using a process to quantify the plurality of levels of goodness, to prioritize the plurality of levels of goodness, and to resolve two levels of goodness into a third level of goodness (see column 11, lines 64 - 67 and column 12, lines 1 - 11)"

However, Agrawal column 11, lines 64 - 67 and column 12, lines 1 -11, states:

"If the action type is "test", documents are tokenized in block 92. In block 94, the root topic is selected as a starting point. In block 96, a top topic is picked form the pool (i.e., a topic with a high goodness score). In block 98, using indexed statistics from block 90 (as indicated by the arrow from block 90 to block 98), the children of the picked topic are evaluated and the best ones (i.e., those with high goodness scores) are added to the pool. In block

100, it is determined whether there are enough leaf topics. <u>If there are not enough leaf topics</u>, at block 96, <u>another topic is picked</u>. Otherwise, the context-dependent signatures are computed in block 102. The computation of context-dependent signatures is discussed in more detail under the "Extracting Document Signatures" heading below. These context-dependent signatures are displayed or indexed in block 104." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses how topics are picked to form a pool based on goodness score and does not disclose using the list of item features in a categorizer system including the plurality of categorizers with the lists of category features to respectively determine a plurality of levels of goodness, the plurality of levels of goodness determined using a process to quantify the plurality of levels of goodness, to prioritize the plurality of levels of goodness, and to resolve two levels of goodness into a third level of goodness.

Regarding claim 22, this independent claim is believed to be allowable for the same reasons as given for claim 1 and because it includes the limitations not disclosed in Johnson of :

"providing a plurality of categories organized in a hierarchy of categories and having respective lists of category features using a categorizer system knowledge base resulting from determining a plurality of documents for determining the lists of category features;
providing a plurality of categorizers corresponding to the plurality of categories;
featurizing the document to create a list of document features;
using the list of document features in a categorizer system including the plurality of categorizers with the lists of category features to respectively determine a plurality of levels of goodness;
using one of the plurality of levels of goodness for invoking an additional categorizer of the plurality of categorizers as required;
categorizing the document in categorizer system including the plurality of categorizers in the plurality of categories based on the respective plurality of levels of goodness from the list;
listing the plurality of categories as the document is compared and the respective levels of goodness on a list; and
returning a category for the document from the list."

Regarding claim 24, this dependent claim depends from independent claim 22 and is believed to be allowable since it contains all the limitations set forth in the independent claim

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from which it depends and claims unobvious combinations thereof. The claim is also believed to be allowable for the same reasons given for claim 2.

Regarding claim 28, the Examiner states in the Office Action page 16 that Agrawal:

"teaches the plurality of categorizers determine the plurality of levels of goodness using a process to quantify the plurality of levels of goodness, to prioritize the plurality of levels of goodness, and to resolve two levels of goodness into a third level of goodness (see column 11, lines 64 - 67 and column 12, lines 1 - 11)"

However, Agrawal column 11, lines 64 - 67 and column 12, lines 1 -11, states:

"If the action type is "test", documents are tokenized in block 92. In block 94, the <u>root topic is selected</u> as a starting point. In block 96, a <u>top topic is picked form the pool</u> (i.e., a topic with a high goodness score). In block 98, using indexed statistics from block 90 (as indicated by the arrow from block 90 to block 98), <u>the children of the picked topic are evaluated and the best ones</u> (i.e., those with high goodness scores) <u>are added to the pool</u>. In block 100, it is determined whether there are enough leaf topics. <u>If there are not enough leaf topics</u>, at block 96, <u>another topic is picked</u>. Otherwise, the context-dependent signatures are computed in block 102. The computation of context-dependent signatures is discussed in more detail under the "Extracting Document Signatures" heading below. These context-dependent signatures are displayed or indexed in block 104." [underlining for clarity]

As would be evident to those having ordinary skill in the art, this statement discloses how topics are picked to form a pool based on goodness score and does not teach or suggest the plurality of categorizers determine the plurality of levels of goodness using a process to quantify the plurality of levels of goodness, to prioritize the plurality of levels of goodness, and to resolve two levels of goodness into a third level of goodness.

Based on the above, it is respectfully submitted that claims 2, 11, 22, 24, and 28 are allowable under 35 USC §103(a) as being unobvious over Johnson in view of Agrawal

Conclusion

In view of the above, it is submitted that the claims are in condition for allowance and reconsideration of the rejections is respectfully requested. Allowance of claims 1-35 at an early date is solicited.

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To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including any extension of time fees, to Deposit Account No. 08-2025 and please credit any excess fees to such deposit account.

Respectfully submitted,

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